

PATENT SPECIFICATION

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(72) Inventor FRANK COOKE



(54) QUICK RELEASE PIPE DRILL

(71) We, E. PASS & COMPANY LIMITED, a British Company, of Denton, Lancashire, England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to devices for under-pressure drilling and plugging of pipes, particularly, but not exclusively, PVC pipes.

It is an object of the invention to provide a drilling and plugging device which is simple in construction and operation.

According to the invention there is provided a drilling and plugging device including a body and means enabling attachment of the device to a pipe, a drilling spindle adapted to be received in a bore in said body and to have mounted thereon a drilling bit or a sealing plug, a valve operable to prevent escape of fluid from the pipe after drilling and before sealing, a feed nut releasably connected to the body, and to the spindle such that on rotation of the spindle when said body and spindle are connected by said nut the spindle will be positively advanced through the bore in said body towards said pipe, and such that the spindle is disconnectable from the feed nut whilst said body and feed nut are connected whereupon the spindle is axially removable from said body.

The feed nut and spindle may be releasably connected by a so-called "bayonet" connection or by a movable latch device having co-operable parts associated with said spindle and with said feed nut.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:—

Fig. 1 is a sectional elevation of a pipe drilling and plugging device clamped to a pipe and showing parts in the drilling position;

Fig. 2 is a similar view showing parts in the plugging position;

Fig. 3 is a sectional elevation of a feed nut device;

Fig. 4 is a view similar to Fig. 1 showing a modification; and

Fig. 5 is a plan view of Fig. 4.

Referring to the drawings, Figs. 1 and 2 show a drilling and plugging device 5 mounted on a PVC pipe 6 by means of a saddle clamp 7. A circular seal 8 carried by the clamp 7 is compressed against the pipe around the area to be drilled and a ferrule 9 is formed integrally with the clamp 7.

The device is screwed to the ferrule 9 by means of an adapter 10 screwed into a valve 11 (shown diagrammatically) attached to the body 12 of the device 5 by a further screw connection. Sealing O-rings 12a are provided between the valve and the adaptor and body respectively. The upper part of the body is externally screw-threaded at 13 for engagement with internal threads 14 on a feed nut 15 so that rotation of the latter in one direction or the other feeds it axially of the body. The upper end of the feed nut is provided with a so-called "bayonet" connection 16 (see especially Fig. 3) for engagement with drilling and sealing means now to be described.

The drilling and sealing means comprises a spindle in the form of a tube 19 to one end of which a handle 21 is welded and the other end of which is provided with a squared head 22. The tube is arranged to pass right through the device 5 in a central passageway provided for that purpose and a seal between the tube and the body is effected by an O-ring 20. A rod 23 secured to a retaining head 24 passes through the tube 19 and is of such a length that it projects slightly beyond the squared head 22. The projecting end of the rod is screw threaded for reception of a

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is designed in known manner so that the cutter 25 as shown in Fig. 1. The cutter 25 disc cut from the pipe is retained within the cutter and does not fall into the pipe.

5 The handle 21 is dimensioned to engage in the bayonet fitting on the feed nut 15. Thus clockwise rotation of the handle, as viewed from above in the drawings, rotates the cutter 25 and also, by virtue of the threaded engagement between the feed nut 15 and the body 12, feeds the cutter downwards as viewed in the drawings. In this way the cutter is fed into the pipe to cut through same.

15 In operation the clamp 7 is attached to the pipe at the desired location and the device 5 is screwed to the ferrule 9 by means of the adaptor 10, the cutter 25 being screwed on to the rod 23. With the handle 21 engaged with the bayonet fitting on the feed nut and the valve 11 open, the handle is rotated and the cutter is thereby fed towards the pipe as previously explained to cut a hole in the latter and retain the disc cut away within the cutter.

25 The handle 21 is then disengaged from the bayonet fitting and raised to bring the cutter up into the body 12 above the valve 11. The latter is then closed and the body 12 is unscrewed from the valve. The cutter is removed and a threaded plug 26 (Fig. 2) is fitted over the squared head 22 of tube 19. The body is then re-connected, the valve is opened and the plug is screwed into the ferrule 9 by further rotation of the handle 21. When the plug is in the position shown in Fig. 2 (blocking the apertures 9a in the ferrule) screwing is stopped and since the plug engages only the squared head 22 of the tube 19, the tube 19 and rod 23 may be withdrawn by raising the handle 21 and feed nut 15 since the latter does not engage the body during insertion of the plug. The device is then unscrewed from the ferrule 9 and a further pipe may be connected to the ferrule as and when required.

50 In the modification shown in Figs. 4 and 5, the upper end of the feed nut 15 is fitted with a cap 30 and the handle 21 engages the cap and the feed nut to rotate same in unison. The upper end of the tube 19 is provided with an enlarged diameter head 31 which is slidable through a central aperture in the cap 30. A series of slots 32 are formed in the head 31 and may be selectively engaged by a pivoted latch lever 33 to lock the head and hence the tube 19 to the cap 30 for vertical movement in unison. In order to raise the tube 19 rapidly clear of the pipe, the latch lever 33 is disengaged from the head 31 and the tube may be raised by means of the retainer 24. The provision of a series of slots 32 enables the full length of

the feed nut 15 to be used irrespective of the pipe diameter.

It will be appreciated that various modifications may be made without departing from the scope of the invention as defined in the claims. For example the notches or slots 32 and lever 33 may be replaced by any other suitable locking arrangement.

WHAT WE CLAIM IS:—

1. A drilling and plugging device including a body and means enabling attachment of the device to a pipe, a drilling spindle adapted to be received in a bore in said body and to have mounted thereon a drilling bit or a sealing plug, a valve operable to prevent escape of fluid from the pipe after drilling and before sealing, a feed nut releasably connected to the body and to the spindle such that on rotation of the spindle when said body and spindle are connected by said nut, the spindle will be positively advanced through the bore in said body towards said pipe, and such that the spindle is disconnectable from the feed nut whilst said body and feed nut are connected whereupon the spindle is axially removable from said body.

2. A drilling and plugging device according to claim 1 wherein said feed nut and spindle are releasably connected by a so called "bayonet" connection.

3. A drilling and plugging device according to claim 1, wherein said feed nut and spindle are releasably connected by a movable latch device having co-operable parts associated with said spindle and with said feed nut.

4. A drilling and plugging device according to any preceding claim, wherein said spindle comprises a tube to one end of which is attached a radially projecting handle and the other end of which is provided with a squared head for reception of a plug and a co-axial screwed head for reception of a cutter.

5. A drilling and plugging device according to claims 3 and 4, wherein said latch device comprises a pivoted latch lever engageable with notch means in a head secured to the upper end of said tube.

6. A drilling and plugging device according to claim 5, wherein a plurality of notches spaced axially of said tube are provided.

7. A drilling and plugging device substantially as hereinbefore described with reference to Figs. 1 to 3, or Figs. 4 and 5 of the accompanying drawings.

For the Applicants:—
WILSON, GUNN & ELLIS,
Chartered Patent Agents,
57, Market Street,
Manchester, M1 1WQ.

is designed in known manner so that the cutter 25 as shown in Fig. 1. The cutter 25 disc cut from the pipe is retained within the cutter and does not fall into the pipe.

5 The handle 21 is dimensioned to engage in the bayonet fitting on the feed nut 15. Thus clockwise rotation of the handle, as viewed from above in the drawings, rotates the cutter 25 and also, by virtue of the threaded engagement between the feed nut 15 and the body 12, feeds the cutter downwards as viewed in the drawings. In this way the cutter is fed into the pipe to cut through same.

15 In operation the clamp 7 is attached to the pipe at the desired location and the device 5 is screwed to the ferrule 9 by means of the adaptor 10, the cutter 25 being screwed on to the rod 23. With the handle 21 engaged with the bayonet fitting on the feed nut and the valve 11 open, the handle is rotated and the cutter is thereby fed towards the pipe as previously explained to cut a hole in the latter and retain the disc cut away within the cutter.

25 The handle 21 is then disengaged from the bayonet fitting and raised to bring the cutter up into the body 12 above the valve 11. The latter is then closed and the body 12 is unscrewed from the valve. The cutter is removed and a threaded plug 26 (Fig. 2) is fitted over the squared head 22 of tube 19. The body is then re-connected, the valve is opened and the plug is screwed into the ferrule 9 by further rotation of the handle 21. When the plug is in the position shown in Fig. 2 (blocking the apertures 9a in the ferrule) screwing is stopped and since the plug engages only the squared head 22 of the tube 19, the tube 19 and rod 23 may be withdrawn by raising the handle 21 and feed nut 15 since the latter does not engage the body during insertion of the plug. The device is then unscrewed from the ferrule 9 and a further pipe may be connected to the ferrule as and when required.

30 In the modification shown in Figs. 4 and 5, the upper end of the feed nut 15 is fitted with a cap 30 and the handle 21 engages the cap and the feed nut to rotate same in unison. The upper end of the tube 19 is provided with an enlarged diameter head 31 which is slidable through a central aperture in the cap 30. A series of slots 32 are formed in the head 31 and may be selectively engaged by a pivoted latch lever 33 to lock the head and hence the tube 19 to the cap 30 for vertical movement in unison. In order to raise the tube 19 rapidly clear of the pipe, the latch lever 33 is disengaged from the head 31 and the tube may be raised by means of the retainer 24. The provision of a series of slots 32 enables the full length of

the feed nut 15 to be used irrespective of the pipe diameter.

It will be appreciated that various modifications may be made without departing from the scope of the invention as defined in the claims. For example the notches or slots 32 and lever 33 may be replaced by any other suitable locking arrangement.

WHAT WE CLAIM IS:—

1. A drilling and plugging device including a body and means enabling attachment of the device to a pipe, a drilling spindle adapted to be received in a bore in said body and to have mounted thereon a drilling bit or a sealing plug, a valve operable to prevent escape of fluid from the pipe after drilling and before sealing, a feed nut releasably connected to the body and to the spindle such that on rotation of the spindle when said body and spindle are connected by said nut, the spindle will be positively advanced through the bore in said body towards said pipe, and such that the spindle is disconnectable from the feed nut whilst said body and feed nut are connected whereupon the spindle is axially removable from said body.

2. A drilling and plugging device according to claim 1 wherein said feed nut and spindle are releasably connected by a so called "bayonet" connection.

3. A drilling and plugging device according to claim 1, wherein said feed nut and spindle are releasably connected by a movable latch device having co-operable parts associated with said spindle and with said feed nut.

4. A drilling and plugging device according to any preceding claim, wherein said spindle comprises a tube to one end of which is attached a radially projecting handle and the other end of which is provided with a squared head for reception of a plug and a co-axial screwed head for reception of a cutter.

5. A drilling and plugging device according to claims 3 and 4, wherein said latch device comprises a pivoted latch lever engageable with notch means in a head secured to the upper end of said tube.

6. A drilling and plugging device according to claim 5, wherein a plurality of notches spaced axially of said tube are provided.

7. A drilling and plugging device substantially as hereinbefore described with reference to Figs. 1 to 3, or Figs. 4 and 5 of the accompanying drawings.

For the Applicants:—
WILSON, GUNN & ELLIS,
Chartered Patent Agents,
57, Market Street,
Manchester, M1 1WQ.

FIG. 1.

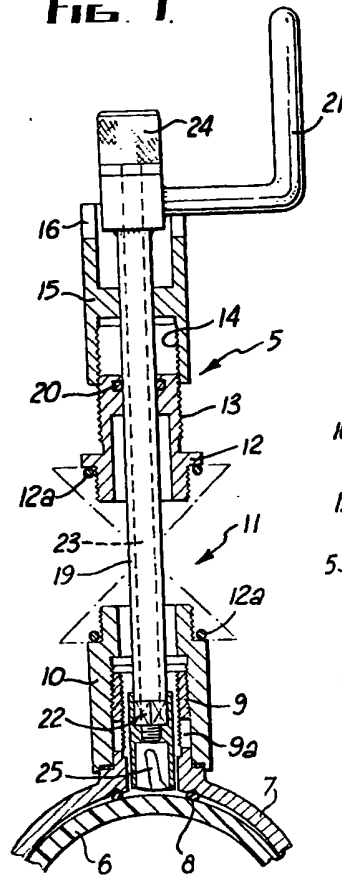


FIG. 2.

